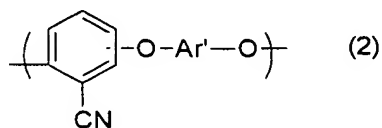
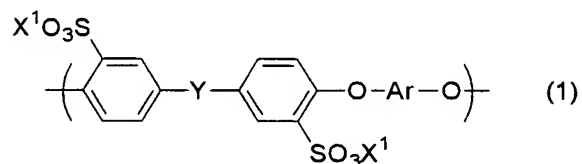


CLAIMS

1. A polyarylene ether-based compound comprising polymer components represented in general formula (1) and general formula (2):

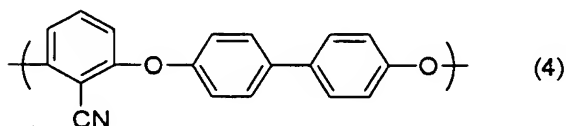
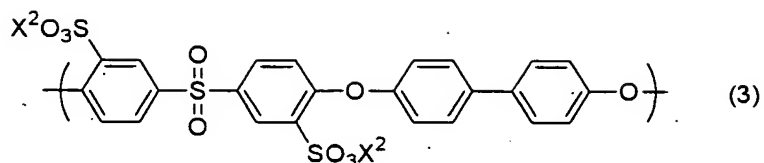


wherein Ar indicates a divalent aromatic group, Y indicates a sulfone group or a ketone group, X indicates H or a monovalent cation species, and Ar' indicates a divalent aromatic group.

2. The polyarylene ether-based compound according to claim 1, wherein at least one of said Ar and Ar' includes a -Ph-Ph- group.

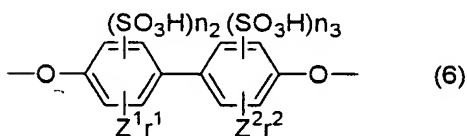
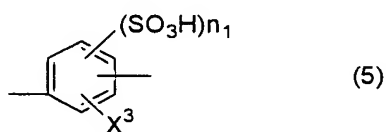
3. The polyarylene ether-based compound according to claim 1, wherein the -O-Ar-O- unit, the -O-Ar'-O- unit or the sum of these units shares 52 wt% or higher in the polymer structure which is a skeleton structure from which the bonded sulfonic group has been removed.

4. The polyarylene ether-based compound according to claim 2, comprising polymer components represented in general formula (3) and general formula (4):



wherein X^2 indicates H or a monovalent cation species.

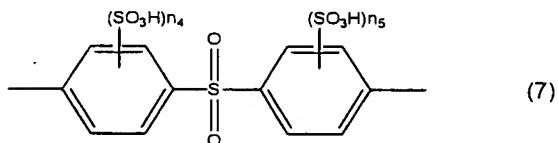
- 5 The polyarylene ether-based compound according to claim 1, further comprising polymer components represented in general formula (5) and general formula (6):



- wherein n_1 , n_2 and n_3 indicate the numbers of bonds of the sulfonic group per an aromatic ring where n_1 , n_2 and n_3 are, respectively, integers from 0 to 2 and $n_2 + n_3$ is an integer from 1 to 4; X^3 is one or more types of functional groups which are selected from the group consisting of -CN, -COOY and -CONR₂, where Y indicates hydrogen, a metal atom or a variety of ammonium and R indicates one or two types of groups selected from the group consisting of hydrogen and alkyl groups; Z^1 and Z^2 are one or more types of functional groups selected from the group consisting of lower alkyl groups having 1 to 6 carbon atoms, lower alkoxyl groups having 1 to 6 carbon atoms, lower carboxyl groups having 1 to 6 carbon atoms, lower carbonyl groups having 1 to 6 carbon atoms, nitro groups, amino groups, hydroxyl groups and halogen atoms, r^1 and r^2 indicate the respective numbers of bonds of Z^1 and Z^2 per an aromatic ring where r^1 and

r^2 are, respectively, integers from 0 to 4 and $n_2 + r^1 \leq 4$ and $n_3 + r^2 \leq 4$.

6. The polyarylene ether-based compound according to claim 5, further comprising a polymer component represented in general formula (7):



wherein n_4 and n_5 indicate the numbers of bonds of the sulfonic group per an aromatic ring where n_4 and n_5 are, respectively, integers from 0 to 2 and $n_4 + n_5$ is an integer from 1 to 4.

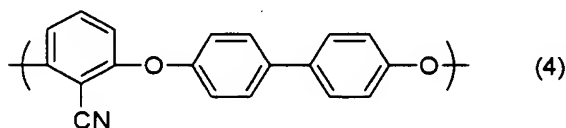
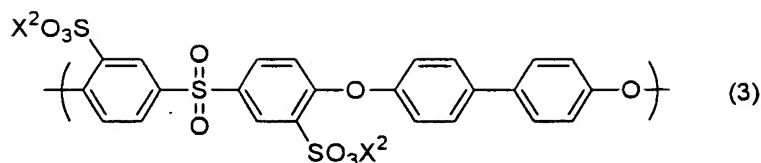
10 7. The polyarylene ether-based compound according to claim 1, wherein the sulfonic group content is within a range from 0.3 meq/g to 3.5 meq/g.

8. The polyarylene ether-based compound according to claim 5, wherein the sulfonic group content is within a range from 0.2 meq/g to 6.0 meq/g.

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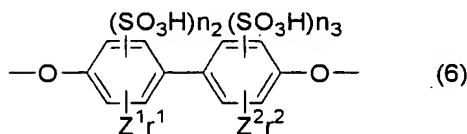
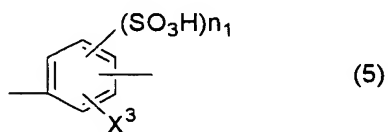
9. A polyarylene ether-based compound which has a structure in that a sulfonic group is introduced to a polyarylene ether-based polymer that includes 52 wt% or higher of a dioxybiphenylene unit (-O-Ph-Ph-O-) in the polymer structure.

20 10. The polyarylene ether-based compound according to claim 9, comprising polymer components represented in general formula (3) and general formula (4):



wherein X^2 indicates H or a monovalent cation species.

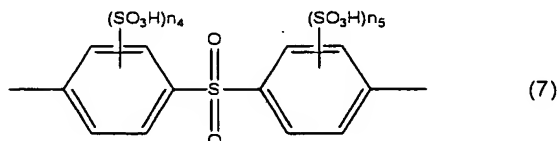
11. The polyarylene ether-based compound according to claim 9, further comprising polymer components represented in general formula (5) and general formula (6):



- wherein n_1 , n_2 and n_3 indicate the numbers of bonds of a sulfonic group per an aromatic ring where n_1 , n_2 and n_3 are, respectively, integers from 0 to 2 and $n_2 + n_3$ is an integer from 1 to 4; X^3 is one or more types of functional groups selected from the group consisting of $-\text{CN}$, $-\text{COOY}$ and $-\text{CONR}_2$, where Y indicates hydrogen, a metal atom or a variety of ammonium and R indicates one or two types of groups selected from the group consisting of hydrogen and alkyl groups; Z^1 and Z^2 are one or more types of functional groups selected from the group consisting of lower alkyl groups having 1 to 6 carbon atoms, lower alkoxyl groups having 1 to 6 carbon atoms, lower carboxyl groups having 1 to 6 carbon atoms, lower carbonyl groups having 1 to 6 carbon atoms, nitro groups, amino groups, hydroxyl groups and halogen atoms, r^1 and r^2 indicate the respective numbers of bonds of Z^1 and Z^2 per an aromatic ring where r^1 and r^2 are,

respectively, integers from 0 to 4 and $n_2 + r^1 \leq 4$ and $n_3 + r^2 \leq 4$.

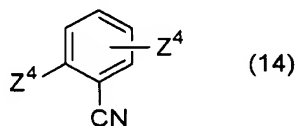
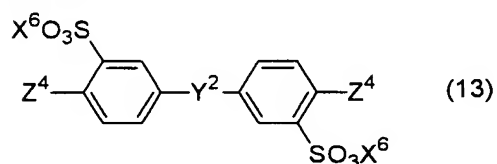
12. The polyarylene ether-based compound according to claim 11, further comprising a polymer component represented in general formula (7):



wherein n_4 and n_5 indicate the numbers of bonds of the sulfonic group per an aromatic ring where n_4 and n_5 are, respectively, integers from 0 to 2 and $n_4 + n_5$ is an integer from 1 to 4.

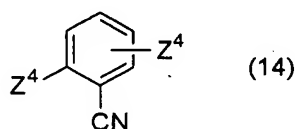
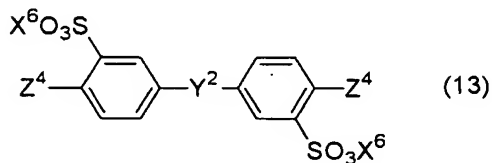
10 13. The polyarylene ether-based compound according to claim 9, wherein the sulfonic group content is within a range from 0.2 meq/g to 6.0 meq/g.

15 14. A manufacturing method of the polyarylene ether compound according to claim 1, wherein compounds represented in general formulas (13) and (14) and a bisphenol-based compound are included in an aromatic nucleophilic substitution reaction as monomers and thus are polymerized:



wherein Y^2 indicates a sulfone group or a ketone group, X^6 indicates a monovalent cation species and Z^4 indicates chlorine or fluorine.

15. A manufacturing method of the polyarylene ether compound according to claim 9, wherein compounds represented in general formulas (13) and (14) and a bisphenol-based compound are included in an aromatic nucleophilic substitution reaction as monomers and thus are polymerized:

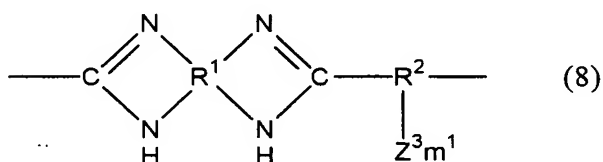


wherein Y² indicates a sulfone group or a ketone group, X⁶ indicates a monovalent cation species and Z⁴ indicates chlorine or fluorine.

16. A composition comprising 50 wt% to 100 wt% of the polyarylene ether compound according to claim 1.

17. A composition comprising 50 wt% to 100 wt% of the polyarylene ether compound according to claim 9.

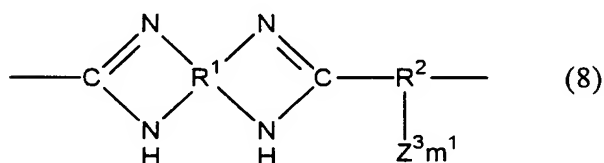
18. A composition comprising: a polybenzimidazole-based compound that includes a polymer component represented in general formula (8); and the polyarylene ether-based compound according to claim 1:



wherein m¹ indicates an integer of 1 to 4, R¹ indicates a tetravalent aromatic bond unit that can form an imidazole ring, R² indicates a divalent aromatic bond unit where both

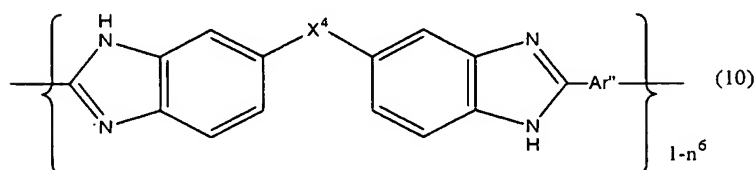
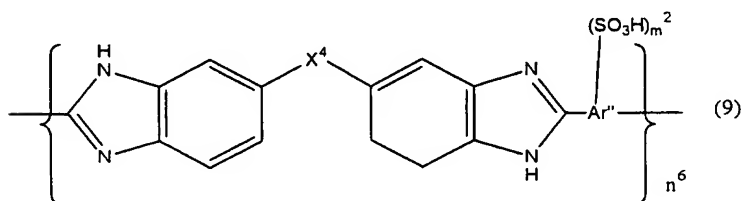
R^1 and R^2 may be single aromatic rings, or combinations or condensed rings of a number of aromatic rings, and may have a stable substitution group, and Z^3 indicates a sulfonic group and/or a phosphonic group a portion of which may have a salt structure.

- 5 19. A composition comprising: a polybenzimidazole-based compound that includes a polymer component represented in general formula (8); and the polyarylene ether-based compound according to claim 9:



- 10 wherein m^1 indicates an integer of 1 to 4, R^1 indicates a tetravalent aromatic bond unit that can form an imidazole ring, R^2 indicates a divalent aromatic bond unit where both R^1 and R^2 may be single aromatic rings, or combinations or condensed rings of a number of aromatic rings, and may have a stable substitution group, and Z^3 indicates a sulfonic group and/or a phosphonic group a portion of which may have a salt structure.

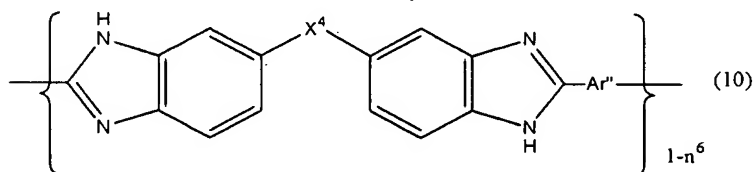
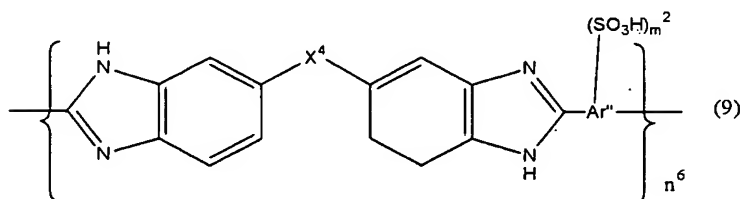
- 15 20. The composition according to claim 18, wherein the polybenzimidazole-based compound contains polymer components represented in general formulas (9) and (10) in a mole ratio of (9) : (10) = n^6 : (1- n^6):



wherein m^2 indicates an integer of 1 to 4, Ar'' indicates a divalent aromatic bond unit, X^4 indicates one or more types selected from the group consisting of $-O-$, $-SO_2-$, $-C(CH_3)_2-$, $-C(CF_3)_2-$ and $-OPhO-$, and Ph indicates a divalent aromatic bond unit where $0.2 \leq n_6 \leq 1.0$.

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21. The composition according to claim 19, wherein the polybenzimidazole-based compound contains polymer components represented in general formulas (9) and (10) in a mole ratio of (9) : (10) = n^6 : $(1-n^6)$:

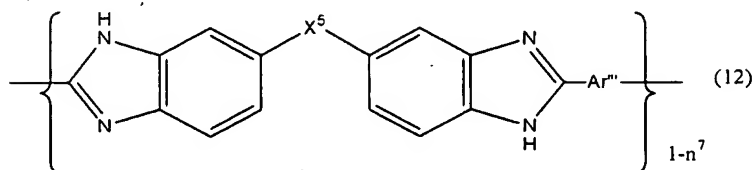
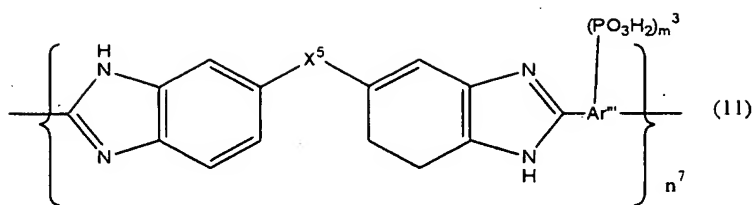


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wherein m^2 indicates an integer of 1 to 4, Ar'' indicates a divalent aromatic bond unit, X^4 indicates one or more types selected from the group consisting of $-O-$, $-SO_2-$, $-C(CH_3)_2-$, $-C(CF_3)_2-$ and $-OPhO-$, and Ph indicates a divalent aromatic bond unit where $0.2 \leq n_6 \leq 1.0$.

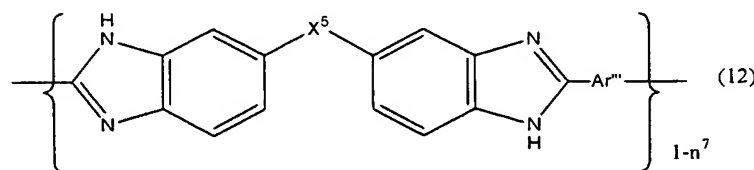
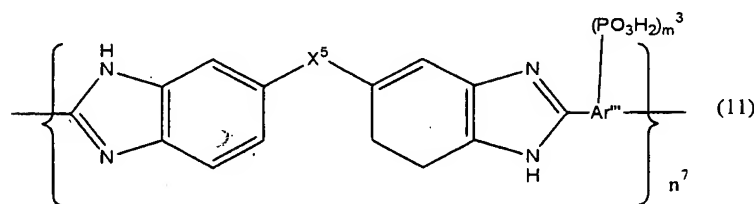
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22. The composition according to claim 18, wherein the polybenzimidazole-based compound contains polymer components represented in general formulas (11) and (12) in a mole ratio of (11) : (12) = n^7 : $(1-n^7)$:



wherein m^3 indicates an integer of 1 to 4, Ar''' indicates an aromatic bond unit, X^5 indicates one or more types selected from the group consisting of -O-, -SO₂-, -S-, -CH₂- and -OPhO-, Ph indicates a divalent aromatic bond unit and n^7 is within a range from 0.2 to 1.0.

23. The composition according to claim 19, wherein the polybenzimidazole-based compound contains polymer components represented in general formulas (11) and (12) in a mole ratio of (11) : (12) = n^7 : (1- n^7):



wherein m^3 indicates an integer of 1 to 4, Ar''' indicates an aromatic bond unit, X^5 indicates one or more types selected from the group consisting of -O-, -SO₂-, -S-, -CH₂- and -OPhO-, Ph indicates a divalent aromatic bond unit and n^7 is within a range from 0.2

to 1.0.

24. The composition according to claim 16, wherein the amount of sulfonic acid and/or phosphonic acid that is included in said polyarylene ether-based compound and/or polybenzimidazole-based compound is 0.5 to 4.0 equivalent/kg.

25. The composition according to claim 17, wherein the amount of sulfonic acid and/or phosphonic acid that is included in said polyarylene ether-based compound and/or polybenzimidazole-based compound is 0.5 to 4.0 equivalent/kg.

26. An ion conducting membrane comprising the compound according to claim 1.

27. An ion conducting membrane comprising the compound according to claim 9.

28. The ion conducting membrane according to claim 26, wherein methanol permeation rate through the membrane with an average thickness of 50 μm in a 5M methanol aqueous solution is 7 $\text{mmol/m}^2\cdot\text{sec}$ or less at 25°C.

29. The ion conducting membrane according to claim 27, wherein the methanol permeation rate through the membrane with an average thickness of 50 μm in a 5M methanol aqueous solution is 7 $\text{mmol/m}^2\cdot\text{sec}$ or less at 25°C.

30. A manufacturing method of the ion conducting membrane according to claim 26, comprising the steps of: casting a solution that contains the compound according to claim 1 and a solvent in a manner where the cast thickness becomes in a range from 10 μm to 1000 μm ; and drying the cast solution.

31. A manufacturing method of the ion conducting membrane according to claim 27, comprising the steps of: casting a solution that contains the compound according to claim 9 and a solvent in a manner where the cast thickness becomes in a range from 10 μm to 1000 μm ; and drying the cast solution.

32. An assembly comprising the ion conducting membrane according to claim 26, and electrodes.

33. An assembly comprising the ion conducting membrane according to claim 27 and electrodes.

34. A fuel cell comprising the assembly according to claim 32.

35. A fuel cell comprising the assembly according to claim 33.

36. The fuel cell according to claim 34, which uses methanol as the fuel.

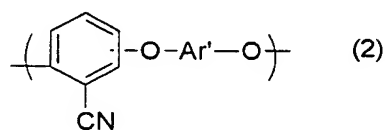
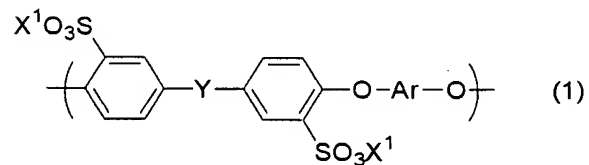
37. The fuel cell according to claim 35, which uses methanol as the fuel.

38. An adhesive comprising the compound according to claim 1.

39. An adhesive comprising the compound according to claim 9.

ABSTRACT

A polyarylene ether-based compound according to the present invention includes polymer components represented in general formula (1) and general formula (2):



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wherein Ar indicates a divalent aromatic group, Y indicates a sulfone group or a ketone group, X indicates H or a monovalent cation species, and Ar' indicates a divalent aromatic group.